INTERNATIONAL RESCUE COMMITTEE

BARUMBU ENVIRONMENTAL HEALTH PILOT PROJECT

FINAL NARRATIVE REPORT FOR USAID
(October 1, 2000 to January 31, 2002)

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I. Executive Summary

Project Title:	Environmental Health Pilot Project, Kinshasa Democratic Republic of Congo
Project Purpose:	Reduce the incidence of diarrheal diseases in the targeted area by working with the community to eliminate various vectors found in the environment.
Project Beneficiaries:	Direct: The residents of approximately 5,000 households in the commune of Barumbu.
Project Location:	Kinshasa, capital of the Democratic Republic of Congo
Project Objectives:	1. Build the capacity of the community to identify and address their own sanitation needs. 2. Improve drainage and wastewater management in the project area. 3. Increase sanitation facility use in the project area. 4. Improve domestic and community hygiene practices in the project area.
Project Duration:	Sixteen months

Objective #1 – To build the capacity of the community to identify and address their own sanitation needs.

The percentage of households in the target area linking sanitation to diarrhea increased by over 40% (from 6.8% to 47%) over the course of the intervention period and by the end of the project 33.3% of households reported having participated in a neighborhood effort to improve sanitation in the community. Eight new community based sanitation organizations were developed at the quarter level and 15 churches committed themselves to community sanitation efforts.

IRC's implementing partner CEBAB, which is a commune-wide community-based sanitation organization, developed the capacity to operate garbage collection, latrine evacuation, and public latrine, none of which lack paying costumers.

Objective #2 – Improve wastewater management and drainage in the project area.

By the end of the project 265 households had subscribed to a regular weekly or twice weekly garbage collection service that properly disposed of the waste so it would not end up in waterways. Furthermore, 536 households were cleaning the tertiary canals around their compounds and the water was flowing freely around 52.1% of the households in the intervention area (as opposed to 37.4% of those in the nonintervention area).

Objective #3 - Increase sanitation facility use in the project area.

A manual MAPET pump and constructed wetlands were introduced to service those households (the vast majority in the commune) that can evacuate their latrine/septic tank neither manually, because the water table is too high to dig a sludge hole in the compound, nor with a tanker truck and motor pump, because roads are inaccessible. Thirteen households have paid for the services of the MAPET pump and over 30 more are on a waiting list. The wetlands have successfully treated over 7,000 liters of wastewater.

Objective #4 – Improve domestic and community hygiene practices.

A comparison of the pre and post intervention surveys indicates changes in several key areas of sanitation knowledge, attitudes, and practices as synthesized below.

Knowledge/Attitude	**1st Study**	**3rd Study**
Percentage of the population surveyed linking diarrhea to sanitation.	6.8%	46.3%
Practice		
Percentage of households surveyed with clean containers for water storage.	49.2%	80.3%
Percentage of households surveyed with cover for pit latrines.	7.3%	16%
Percentage of households surveyed with garbage cans.	73.4%	84.1%
Percentage of households surveyed paying push carts to remove garbage.	66.9%	86.4%

Practices that were targeted but did not change by statistically significant measures were the number of households with a latrine (96.7% pre intervention and 97.7% post intervention) and the number of housewives demonstrating proper hand washing techniques (60.1% pre intervention and 52.5% post intervention).

II. Program Overview

Goal and Objectives

A. Program Goal

The goal of the project was to reduce the incidence of diarrheal diseases in the targeted area by working with the community to eliminate the various vectors found in the environment. The intervention was designed after an assessment in the field and a prioritization exercise (conducted by USAID) with stakeholders from donor, local and international NGO, and government organizations. These stakeholders identified the blocking of canals, subsequent flooding of sewers, and the concomitant exposure of fecal matter as some of the primary causes of diarrhea in Kinshasa. Another cause cited by stakeholders is inappropriate household and personal hygiene practices such as the improper disposal of fecal waste directly into open canals and poor water storage and hand washing practices.

As a pilot project the program aimed for maximum results, thus the selection of a small, fairly self-contained intervention area where, because problems are concentrated and very visible, awareness is high. IRC chose the drainage point of a small, self- contained watershed that includes roughly 5,000 households. It was determined that in order to improve drainage, household garbage must be collected and properly disposed of so that it would not be thrown in canals and block water flows so a garbage collection enterprise was established. A technologically appropriate latrine/septic tank manual pump and accompanying wetlands sewage treatment center were introduced as means of evacuating latrines, rendering them functional, without dumping sewage into open canals. A public latrine was also built for use by market vendors and clients and by those adjacent households without a private latrine. An extensive IEC campaign was implemented to market the use of waste collection services and to promote changes in personal hygiene behavior.

Most project activities were implemented in partnership with CEBAB, a community-based sanitation association that had previously organized the cleaning of canals in the commune. IRC provided CEBAB with technical, financial management, logistical, and materials assistance in launching garbage collection, composting, latrine evacuation, and public latrine enterprises. By the end of the project all of these enterprises were servicing clientele to varying degrees and the garbage collection and public latrine enterprises were recovering costs. IRC is in the process of seeking additional funds to continue its oversight of and support for CEBAB in order to ensure the continued success of all enterprises.

The objectives of the proposed activities were:

1. Build the capacity of the community to identify and address their own sanitation needs.
2. Improve wastewater management in the project area.

3. Increase sanitation facility use in the project area.
4. Improve domestic and community hygiene practices.

III. Program Performance by Objective

Objective #1 – To build the capacity of the community to identify and address their own sanitation needs.

The broad nature of sanitation-related causes of diarrhea requires that they be addressed by the community as a whole. This is particularly true in Kinshasa where public services cannot be relied on and any initiative must come from the population. Therefore, the project strove to build the capacity of the community of the targeted area to recognize that poor sanitation presents a health problem and to initiate and ensure the success of appropriate responses.

Indicators:

1. Members of the community that are implicated are able to identify and prioritize issues and develop appropriate initiatives to address those issues.

Throughout the project IRC worked to improve the capacity of the *Cellule de Base Pour l' Assainissement de Barumbu* (CEBAB), a community-based organization (CBO) that had already existed in Barumbu to address the issue of the regular inundation of the neighborhood. CEBAB members had cleaned out the major canals under a food for work program implemented by FOLECO, a German government-supported local NGO, and were interested in follow up activities to help prevent their blockage again. It was the members of CEBAB working with IRC that identified the collection and proper disposal of garbage as a means of keeping canals clear of garbage and therefore flowing freely. CEBAB also identified the evacuation of latrines and proper disposal of sludge as a way of keeping fecal matter out of open canals and of increasing the number and use of functioning latrines in the commune.

IRC worked with CEBAB throughout the project, building its technical, logistical, and financial capacity to operate garbage collection and composting, latrine evacuation and sludge treatment, and public toilet enterprises. CEBAB members attended formal trainings in the techniques of sorting and composting biodegradable household waste, the operation and maintenance of a manual pump for the evacuation of latrines, and the operation of a manmade wetlands for the treatment of latrine sludge. IRC and its partner WASTE, a waste management consultancy firm based in the Netherlands, also provided CEBAB with extensive financial management and marketing technical assistance on a mentoring basis.

IRC furnished nine pushcarts to CEBAB for the collection of garbage, a composting facility, equipment, and dumpsters for the management of garbage, the manual MAPET

pump for the evacuation of latrines, a small man made wetlands for the treatment of latrine sludge, and a public toilet facility in a market. IRC also assisted CEBAB with the initial payment of salaries to staff until enterprises could generate enough income to cover these themselves.

Finally, IRC ensured that CEBAB could support all of these activities with an effective information, education, and communication (IEC) campaign by providing for a two-week training in IEC techniques and public health principles for eight community educators. IRC also provided materials and a stipend to these educators throughout the course of the project.

IRC worked with CEBAB to increase the degree to which it received input from and was answerable to the rest of the community. The stated mission of the organization includes addressing the sanitation needs of the entire commune and yet it was criticized by some quarter chiefs for the centralized nature in which decisions were made and activities implemented. Efforts to address these weaknesses included the realization of a general assembly to restructure the organization and decentralize activities allowing for greater input and participation from the wider community.

During this general assembly new sanitation committees were created for each quarter of the commune, giving quarter chiefs and leaders more control over sanitation activities. The role of these committees is to identify sanitation needs and develop and implement programs designed to address those needs in their respective quarters. These eight new neighborhood sanitation committees became quite active in their own right, organizing at least one or two community work days a month in their respective quarters, some with turnouts in the 100s. Three of these committees had regularly scheduled workdays every month during which they cleaned out of public canals, cut grass in public open spaces, and cleaned up garbage.

The most extensive activity organized and conducted by the new sanitation committees during the course of the project was ‘Operation Bopeto’ in the Kapinga quarter. Operation Bopeto was a campaign implemented by the community to reward individual households for taking the initiative to address sanitation issues at the household level. The seven-month campaign identified over 150 households (out of a total of 908) that met all of the following criteria: 1) possess a covered garbage can; 2) possess a clean latrine with a lid (if traditional); 3) clean compound and surroundings; 4) allow no open containers of standing water in the compound or surroundings; 5) clean out and ensure the proper flow of water in canals in front of compound, and; 6) possess a functioning drainage system. These model households were rewarded with a certificate and most of them were interviewed on television regarding their success.

The fact that CEBAB was already in existence and had implemented sanitation activities in Barumbu made it a natural target for IRC’s support. Efforts were also made however to include a broader segment of the population of the commune in identifying and addressing community sanitation needs. For example, pastors and representatives from 15 churches in the community were invited to and attended an all day seminar regarding

of the role that churches can play in educating the community about sanitation issues. Topics included appropriate bible verses and a discussion of concrete actions that the religious community can take to work toward improved hygiene in the commune.

This initiative resulted in not only the spreading of sanitation messages at churches, by pastors and CEBAB educators alike, but also in an increase in the participation of the churches in their own and community sanitation activities. For example, the targeted churches now ensure that their own compounds are clean and those without latrines have started installing them. Some of the churches have even organized parish clean-up days to pick up garbage and clean out canals.

2. Community is aware of nature and level of existing issues.

Pre and post project surveys indicate that the community demonstrates an increased awareness of the link between sanitation and health. Before intervention activities the lack of sanitation in the community was indicated as a cause of diarrhea by only 6.8% of persons interviewed. After the project 47% of those interviewed cited diarrhea as a disease that is transmitted by a lack of sanitation. Causes for the poor sanitary conditions of the commune according to post intervention focus groups (made up of men, women, commune officials, quarter chiefs, and adolescents) include the improper disposal of garbage, the improper management of human excreta, and the lack of well-functioning canals to ensure proper drainage.

3. Community organizations/individuals are able to implement concrete activities to address issues.

Interventions have increased the ability of organizations and individuals to implement concrete activities to address their sanitation issues. The CBO CEBAB is currently operating enterprises for the collection and proper disposal or treatment of garbage and latrine sludge as well as a public toilet. These enterprises provide individual households with the opportunity to properly dispose of their garbage, latrine sludge, and, in the event that they lack a functioning private latrine, excreta.

By the end of the project 265 households had subscribed to a regular weekly or twice weekly garbage collection service and 13 households had paid to have their latrines evacuated with CEBAB's manual MAPET pump. An average of 30 persons a day were using the public toilet and an estimated additional 536 households had cleaned out canals around their compounds. Over 30% of households interviewed post intervention reported having participated in community sanitation activities in the last six months.

4. Community organizations/individuals are able to monitor activities and evaluate their impact on issues.

Post intervention focus group discussions indicate that inhabitants of the community have been monitoring the activities of CEBAB and that the perception of the majority of them is that the organization has been successful in addressing community sanitation issues.

Groups of men, women, quarter chiefs, commune officials, and adolescents all cited examples of changes in sanitation conditions and behaviors due to CEBAB's activities. Examples of changes in sanitation conditions cited included the fact that water is running freely in major canals, market hygiene is improved, and individual compounds and adjacent tertiary canals are kept clean. Examples of changes in behavior that were mentioned by mothers and fathers included a greater attention to household hygiene, the proper disposal of excreta (particularly that of children), and hand washing. Adolescents claimed that parents now insist that hands are washed before eating and after the use of the toilet.

Objective #2 – Improve wastewater management and drainage in the project area.

When sanitation needs were assessed and prioritized with the community of the project area it was determined that ensuring suitable drainage in the area required the proper disposal of household garbage, which is habitually thrown into canals causing blockage. Therefore, program activities included the initiation of a garbage collection enterprise to collect and properly dispose of household garbage. Additionally, the program included IEC activities that supported the manual cleaning of household tertiary and community secondary and primary canals.

Garbage Collection

CEBAB was provided with nine pushcarts and IRC assisted with the initial development and management of an enterprise that collects, sorts, and composts garbage. By the end of the project the enterprise had a total of 265 subscribers of a regular collection service as well as a number of daily clients.

Those households that are subscribers have each signed a contract with CEBAB indicating the number of times a week that garbage is to be collected. Based on these contracts the pushcarts are sent to a different part of the commune each day with a list of households from which to collect garbage. At the end of the day drivers submit a report indicating houses that were serviced and it is based on these that a monthly bill is calculated for each client. The cost for the garbage collection service is 35 to 400 Congolese Francs per load, depending on the volume of garbage. The drivers are paid 50% of that which is collected for the month.

Initially, the garbage was dumped at the IRC-constructed composting center where it was sorted and organic matter composted. Over the course of the project this center sold 183 50-kilo sacks of compost at $3.00/sack. Waste that could not be composted was put in a dumpster that was emptied by PNA, the national sanitation service.

CEBAB was unable to establish a market for its compost however and PNA regularly increased it prices and provided unreliable service so by the end of the project four of the push carts were being used twice a week to transfer garbage from CEBAB's site in

Barumbu to the PNA-authorized dumping area (a major erosion-created ravine) five kilometers away.

Canal Clean Up

Community educators counted 536 households in the targeted area that currently clean the tertiary canals around their compounds. Community workdays, which often included canal clean up, were being organized on an average of 1-2 times a month in each quarter of the intervention area by the end of the project period. The post intervention evaluation determined that water was flowing freely in canals around 52.1% of the households in the intervention zone as opposed to 37.4% of the households in the control area.

Indicators:

1. 50% increase in the use of garbage collection services in the project area.

According to pre and post intervention surveys, the number of households paying to have their garbage removed by push carts increased by 19.5%. This figure is much lower than the targeted 50%, which is probably best explained by the fact that the target was set before the baseline data was gathered. In fact 66.9% of households reported having garbage collected by pushcarts before intervention activities, a figure much higher than suspected.

It should be noted that the number of households that subscribe to CEBAB's garbage collection operation (265 with steady growth throughout the project period) is perhaps a more significant indicator of overall sanitation than simply the percentage of households having garbage collected by pushcarts in general (which is what was measured by the surveys). The reasons for this are twofold; 1) CEBAB's service is on a regular basis, greatly reducing the possibility that households use a pushcart only on occasion, when one is available, and 2) other pushcarts may improperly dispose of garbage, they often dump it in waterways for example, exacerbating the community sanitation problem whereas CEBAB either composts it garbage, pays PNA to properly dispose of it, or disposes of it in a PNA-authorized dump site.

2. Decrease in the indiscriminate disposal of household garbage as measured by the absence of garbage in canals and waterways.

Pre and post intervention surveys indicate that the percent of households reporting the disposal of garbage in the streets or waterways decreased by 6.9% (from 7.8% to .9%). Furthermore, participants of all focus groups cited cleaner canals and waterways as visible impacts of CEBAB's interventions in the area.

3. Sustainability of the garbage collection enterprise.

Three months after the cessation of IRC assistance the garbage collection enterprise is still in operation. Pushcart drivers are regularly paid from the payments collected from

clients. When spare parts or repairs are needed CEBAB is able to pay for them from funds generated by payments for services or from funds generated by the public latrines.

The service is in high demand because it offers regularity, which independent pushcart drivers do not, and households are confident that their garbage will be disposed of properly, while they suspect that independent drivers dump garbage in the nearest open space. Furthermore, according to the SPH's post intervention survey, there is no cost difference between the two services.

The only problem with the service is that it is limited and not capable of meeting the demand in the neighborhood. The SPH's post intervention survey indicates that 61% of those households surveyed in the intervention zone opined that the CEBAB pushcarts did good work, 22.1% said that they should increase the amount of work that they do to have a greater impact, and 15.1% said that the pushcarts do not service their street.

4. Generation and proper use of funds to finance clean up of public areas, particularly canals and waterways.

While the generation of extra funds from the various enterprises developed by the project was foreseen, it was not realized. Sufficient income was not generated for a number of reasons that included management and marketing weaknesses but also, more importantly, the nature of doing business in Kinshasa.

The garbage collection/composting enterprise was not as lucrative as had been foreseen for reasons that included initial weaknesses in the collection of fees for services (which was resolved) and in the marketing and sale of compost. They also however, included the fact that PNA, which was paid to properly dispose of garbage, continuously inflated its prices, exploiting the fact that CEBAB was, initially, able to pay its fees (one of its few costumers with that ability).

The public latrine operation was not as lucrative as had been foreseen because an average of 15-20 public officials a day use the facility without paying, citing their privileges as employees of the state. Profits were also reduced when REGEDISO, the state water service, charged private industry rates for the water at the tap stand that accompanies the latrines, after indicating at the conception of the project that such a public service would be provided free of charge.

5. Sustainability of recycling and composting enterprise.

CEBAB found that the market for compost in the area around the facility was not great enough to support the composting enterprise. Such an enterprise might be feasible with targeted marketing activities and if the means for transporting the compost to more agricultural intensive areas of the city were available.

Objective #3 - Increase sanitation facility use in the project area.

Two strategies were undertaken to increase sanitation facility use in the project area. One was the introduction of a manual pump/wetlands combination to facilitate the evacuation of household latrines and septic tanks. This intervention was proposed in response to initial project assessment activities that indicated that one reason why people do not use their toilets is because the septic systems are full and quite impossible to empty via currently available services.

The second strategy was the construction and operation of a public toilet facility so that those persons without access to a private latrine have the means of properly disposing of their excreta.

A third strategy that had originally been proposed was that of septic tank repair but upon commencing work in the intervention zone it was noted that a private organization was already meeting the existing demand for this service.

MAPET Pump and Constructed Wetlands

The MAPET pump, a portable manual pump designed to evacuate septic tanks and latrines was introduced to IRC, CEBAB, and commune, city, and national officials by a consultant from WASTE, a waste management firm based in The Netherlands. The pump is designed to evacuate 120 liters of sludge at a time from either a latrine or a septic tank and then be hand pushed to an off site dumping point. As such, it represents the sole viable sludge evacuation option to the many households in the neighborhood that can evacuate their latrine neither manually, because the water table disallows the digging of a hole in the compound, nor with a motorized pump and truck because the equipment can not access their compound.

The pump was presented to CEBAB on loan and a team was formed to operate and maintain it. CEBAB markets the pump and organizes evacuations for 60% of the proceeds while the operators keep 40% for themselves. Technically the pump has performed fairly well; there were some initial problems with the connection between the pump and waste recipient but these were resolved by CEBAB. It has been used to evacuate the latrines of thirteen households.

The limited use of the MAPET pump to evacuate latrines to date has been due to the delay in constructing the wetlands designed to treat the sludge evacuated. Without the wetlands evacuated sludge has to be buried on site, posing the same limitation for many households as the traditional hand evacuation system. While focus groups conducted during a mid term rapid assessment of the project indicated that a fair number of households are interested in the system and indeed there is a waiting list of over 30 households, this interest is limited to its ability to treat the sludge off site.

The constructed wetlands, which are designed to treat sludge off site, were delayed for political reasons and not completed until the end of January, a month after the originally scheduled closure of the project. The system has been used to treat 7,000 liters of wastewater and tests show that contaminants were reduced to a level that were within the government standards set for a household affluent. This was confirmed by a WASTE consultant who visited in March and assessed the structure's integrity and capacity to properly treat sludge. CEBAB has however, been reticent to use the facility. This may be due in part to the politically sensitive nature of the issue and in part to the unfamiliarity with, and lack of confidence in, the technology. IRC continues to follow the program with its own funds, providing CEBAB with the technical support and assistance required to increase confidence in the system. IRC is also seeking additional funding in order to increase the level of technical assistance it is able to provide and to ensure the proper use of the wetlands in the treatment of sludge.

Public Latrines

Four latrines were constructed in the EPOLO market in the project area. The latrines have two holes and are designed so that one hole can be used for two years before filling up, at which point it can be closed up and the waste composted while the second hole is used. A faucet and hand-washing area was installed next to the latrines and soap is provided to latrine clients. Follow up visits verify that the facility is clean and well maintained and serves an average of 30 clients a day.

Indicators

1. A 25% increase in the number of functioning sanitation facilities and a concomitant increase in facility use.

The pre and post intervention collection of data suggests that this indicator is not a wholly appropriate measurement of the objective. Surveys indicate that the great majority of households in the intervention area have latrines (96.7% pre intervention and 97.1% post intervention) and that most of these are functioning (99% pre intervention and 96.4% post intervention). More appropriate indicators of the project's impact on the use of latrines and the proper management of human excreta are the state of hygiene of the latrines (participants of pre intervention focus groups cite unhygienic conditions as a primary reason for the nonuse of latrines), and the management of sludge removed from latrines.

The overall hygiene of latrines was measured during pre and post intervention surveys by using a variety of parameters that included the existence of fecal matter on the walls and paper, the presence of flies, and the presence of effluents. While there were no real changes pre and post intervention, there was a statistically significant change in the presence of effluents in household latrines. In the pre intervention survey effluents were present in 34.7% of the cases, post intervention this number was decreased to 23.4%. Intervention activities designed to control effluents included education efforts promoting

latrine evacuation and improved household drainage and the introduction of the MAPET pump.

The proper management of sludge emptied from latrines was not assessed during the pre intervention survey however a control group was interviewed during the post intervention survey which showed a statistically significant higher propensity to dispose of sludge in an open hole rather than in a more hygienic closed pit. Of those persons interviewed in the intervention zone 42.1% report dumping sludge in a closed pit compared to 23.8% in the non-intervention zone. Conversely, 23.7% of persons interviewed in the intervention zone reported using an open hole as opposed to 47.6% in the non-intervention zone.

2. Viable systems are in place to sustain an increase in the number of functioning sanitation facilities.

The combination of the use of the MAPET pump to evacuate latrines and the use of the constructed wetlands to treat the evacuated sludge is a system that has shown initial promise technically and in terms of marketability.

The MAPET pump has proved to be technically sound and quite popular, often providing the only option for latrine evacuation in the commune. The wetlands are structurally sound, conform to systems that have had success in other cities, and are effectively treating wastewater.

The SPH's post intervention survey indicates that people are willing to pay for the MAPET service even though it is over three times more expensive than that of the traditional manual evacuation which is the most often used method. Of those MAPET clients surveyed 90% stated that the amount that they paid for the service was acceptable, for manual evacuation this figure is only 70.8%. For private motor pump evacuation (which is double the cost of MAPET) the figure drops to 37.8% and for government evacuation services (rarely available), 50%. There is currently a waiting list of over 30 households that have requested that their latrine be evacuated by the MAPET pump.

3. Public market sanitation facility upkeep is financed in a sustainable manner by the collection of fees for use.

The public toilet generates $35/month, enough income to fully pay the member of CEBAB that staffs it as well as for cleaning products and materials.

Objective #4 – Improve domestic and community hygiene practices.

Ten community educators were selected from the intervention area and trained by the School of Public Health (SPH) over a two-week period. The training included IEC techniques and strategies and basic public health concepts such as the links between

sanitation and diarrhea. Of the ten educators trained, eight were selected to work full time in the project area, the remaining two were back up.

The messages delivered by the educators revolved around three main themes, the proper disposal of garbage, the importance of maintaining clean drainage ditches, and the proper disposal of human waste. The educators promoted all services delivered as part of the project and prepared the population for new initiatives through education and the dispelling of rumors. The efforts of the educators resulted in an increased understanding of the link between sanitation and diarrhea and the adoption of proper hygiene behaviors, a steadily increasing demand for the sanitation services provided as a part of the project, and the general acceptance of such initiatives as the compost center and the constructed wetlands in the neighborhood.

Three months after the termination of IRC support the eight educators continue their activities, occasionally compensated by CEBAB. They are following up with households and neighborhood committees to support new initiatives and the maintenance of progress made to date. They plan to disseminate the results of the SPH's final survey once the report is finalized and published.

The forum through which the educators transfer their messages include home visits and discussions, assemblies organized and held in schools, churches, and other public places, and follow-up visits designed to reinforce messages at the household level. Throughout the course of the project such activities were conducted at the rate of:

Activity	**Frequency**
Community Education Discussions	15/month
Household Visits and Discussions	613/month
Follow up Visits to Households	288/month

Mothers and young girls were the primary recipients of messages although fathers and boys are targeted in at least 10% of the activities.

The activities of the community educators were supported by radio and television broadcasts by the health unit of the *Radio Television Nationale Congolaise* (RTNC). Messages broadcasted included the promotion of project related services such as the collection of garbage, composting, and the use of MAPET, and the coverage of project related activities and programs, such as 'Operation Bopeto', a motorized caravan, and carnivals. They relayed health information such as the link between sanitation and diarrhea and the importance of proper hygiene as well.

Mass media techniques also included the use of formal and street theater to disseminate hygiene messages. Special events such as motorized caravans, carnivals, and 'information days', including the dissemination of KAP survey results and CEBAB's general assembly, were held to increase awareness and understanding of program initiatives and services.

Media coverage during the course of the project included:

Type of Media	**Frequency**
Radio	7 broadcasts/month
TV	2.5 broadcasts/month
Street Theater	7 productions/month
Special Events	5 total

During the post intervention survey 65.7% of all households interviewed in the intervention zone reported having been visited by a CEBAB community education agent, 24.9% reported having attended a community education session, 13% followed a radio or TV program, and 13.5% a theater event.

Indicators

1. Organizations and individuals within the community prioritize issues and develop strategies and work plans for addressing those issues.

IRC worked closely with CEBAB and the *Bourgemeister* and other commune leadership to prioritize issues and develop strategies for addressing those issues. CEBAB and local government representatives were present during the initial project planning workshop and participated in and were presented with the results of KAP surveys and other needs assessment tools.

2. Ten members of the community and one IRC staff member are able to conduct sanitation KAP surveys and develop IEC strategies and work plans based on survey information.

Ten members of the community were trained in IEC techniques including the implementation of needs assessment tools and the development of strategies based on KAP survey results. The eight community educators working in the intervention area designed and conducted their own survey to determine the interest of members of the Libulu market in improved sanitation facilities. Interest in public latrines and a fountain was found to be high and the mayor's office of the city of Kinshasa has committed to rehabilitating existing facilities.

Four individuals from the Bumbu commune were also trained by the project in IEC techniques and used their skills and the successes in Barumbu to reenergize their own community based sanitation organization called CEBEA. This organization initiated educational, garbage collection, and public latrine management activities in its own commune.

3. Baseline, midterm and final studies are conducted that generate information that can be used in the development of appropriate IEC messages, strategy, and work plan, and that can be used to monitor and evaluate program activities.

The School of Public Health was contracted to conduct pre, mid, and post intervention surveys which were published in December 2000, June 2001, and January 2002. The first study involved focus group discussions with nine groups that included women, young adults, local NGO members, quarter chiefs, CPP members, commune hygiene technicians and market vendors. It also included a survey of 961 households and interviews with representatives from 12 health centers, 11 schools, 28 churches, 20 hotels/bars and restaurants, and seven markets. The study was designed to gather data about existing knowledge, attitudes, and practices surrounding diarrhea, sanitation, and hygiene and the results were used to develop the strategies and messages used in the ensuing IEC campaign.

The second study involved the facilitation of nine focus groups, made up of the same category of persons interviewed for the first study, and a survey of 212 heads of households, 121 of which reside in the intervention area. This study uncovered some areas for improvement in educational activities including the fact that messages were not reaching the heads of households because they were often gone during working hours. This issue was addressed by creating a second shift for the educators and scheduling half of them to work evening and weekend hours.

The third study included a tenth focus group, that of members of CEBAB, and surveyed 684 households, 347 of which are in the intervention zone. Representatives from 17 health centers, 17 schools, and eight churches were also interviewed. The results of the third study were compared to those of the first to note changes in sanitation knowledge, attitudes, and behaviors among the inhabitants of the intervention area.

4. Sanitation knowledge, attitudes, and practices change according to IEC messages.

A comparison of the pre and post intervention surveys indicates changes in several key areas of sanitation knowledge, attitudes, and practices. Many of these are mentioned above but are also synthesized below.

Knowledge/Attitude	**1st Study**	**3rd Study**
Percentage of the population surveyed linking diarrhea to sanitation.	6.8%	46.3%
Practice		
Percentage of households surveyed with clean containers for water storage.	49.2%	80.3%
Percentage of households surveyed with cover for pit latrines.	7.3%	16%
Percentage of households surveyed with garbage cans.	73.4%	84.1%
Percentage of households surveyed paying push carts to remove garbage.	66.9%	86.4%

Practices that were targeted but did not change by statistically significant measures were the number of households with a latrine (96.7% pre intervention and 97.7% post intervention) and the number of housewives demonstrating proper hand washing techniques (60.1% pre intervention and 52.5% post intervention).

IV. Lessons Learned

Pilot Project Results

The project was designed to be a pilot project with the primary objective of introducing innovative, decentralized, income generating, waste management systems that might prove to be part of the solution to Kinshasa's massive solid and fecal waste problem. The question to be answered was, **"Will the population pay for decentralized, private sanitation services?"** and the overwhelming response was **"yes"**. Garbage collection, public latrine, and latrine evacuation enterprises were introduced and with the exception of the latrine evacuation enterprise, were paying for themselves within the 16 months of the project period. In fact, the garbage collection and latrine evacuation services cannot keep up with demand.

Another question that the project strove to answer was, **"Will the population participate in improving sanitation at the household and community levels?"**. Again the answer was **"yes"**. With an education effort that increased the number of households linking sanitation to diarrhea by over 40% and focused the attention of the commune on the issue households changed four out of six hygiene practices targeted and became involved in community-wide sanitation efforts in the hundreds. By the mid term evaluation 21.8% of those surveyed reported having participated in community sanitation activities, by the post intervention survey the number was 33.3%. Eight neighborhood committees were formed for, and 15 churches became involved in, the promotion of proper individual household and community sanitation practices.

The population appreciates and supports intervention activities and a significant majority expressed a desire that they continue. Eighty-one percent of those interviewed post intervention said that there was a noticeable change in the sanitation of the commune since the commencement of project activities. Ninety-four percent supported the continuation of CEBAB's activities expressing a continued willingness to pay for services. A majority of focus group participants credited CEBAB's activities with improved drainage in the area, improvements in market and household hygiene, and a reduction in cholera and diarrhea.

As a pilot project however, the intervention was designed to be followed up upon. Educational activities and the introduction of innovative waste management systems created a demand that was not met by the limited activities of the project. Furthermore, some of the technology introduced by the project, most notably the wetlands but also to some extent the MAPET pump, is new and not previously tested in Kinshasa (not even widely tested in the world). The time required for such technologies to be accepted is

greater than that provided by a pilot project. Continued oversight is advisable also as the use of this technology increases and maintenance becomes necessary.

Therefore, IRC is currently seeking the funding required to maintain and expand those services introduced in Barumbu. The initial successes attained by the decentralized waste management systems introduced in Barumbu show too much promise as possible solutions to Kinshasa's waste management problems to remain as stand alone interventions.

Local CBO Implementing Partners

Much of the success of this project was due to the fact that activities were implemented by CEBAB, a sanitation CBO already operating in the commune. This is also why many activities have continued after the termination of IRC support. Working completely through a local organization requires time-consuming capacity-building activities however that are beyond the scope of a short-term pilot project. Additionally, while IRC was able to provide technical assistance and extensive mentoring, there was no mechanism in the project for formal organizational development and business management training for CEBAB. Such an activity would have greatly facilitated that organization's efforts to operate the various enterprises that were started up as part of the project. Future projects that are implemented by NGO or CBO partners should consider the inclusion of such formal training at the outset to ensure that those organizations have the organizational capacity to carry out program activities.

IEC Techniques

The post intervention survey and focus group discussions provide information about the project's IEC campaign that can be used in similar campaigns in the future. For example, a greater percentage of persons interviewed reported having seen a theater production about sanitation (13.5%) than having heard a radio or television program (13%) and yet relatively expensive radio and television coverage is purchased with the assumption that its coverage is high. Furthermore, focus group participants cited theater as the IEC technique that best relayed messages.

V. Impact of Project Activities on the Environment

Social

The project resulted in a measurable increase in the ability and willingness of the population to identify and address their own sanitation needs as individual households and as a community. The population demonstrated an increased understanding of the link between sanitation and diarrhea and a concomitant increase in the adoption of proper hygiene practices.

Political

Project activities generated some degree of political dissatisfaction in the commune as some quarters were targeted more than others and some leaders more involved than others in the decision-making processes. These issues were raised to some extent during the post intervention focus group discussions in which some local leaders opined that activities were not extensive enough and power sharing not broad enough.

The project was designed to focus on those households immediately straddling the Belgika River, which is the primary drainage canal in the commune. The strategy was to start with this canal, on which the drainage of the entire commune relies, and work from there. This excluded some quarters of the commune and minimized the level of activities in others, which caused resentment among the leaders of those quarters. As indicated above, IRC is seeking the funds to support CEBAB in the expansion of activities to those underserved portions of the commune.

IRC made efforts throughout the project to work closely with and secure the support of all political and social leaders of the commune and enjoyed a close working relationship with the *Bourgemeister* and other government officials. Several open meetings were held throughout the course of the project period and an attempt was made to be as transparent and inclusive as possible. Power struggles among local political entities ensued nonetheless, particularly as financial and logistical support was provided to some groups and not others. These issues, while all eventually resolved, did delay some project activities and proved to be a serious constraint to the success of the wetlands, which were blocked for months for political reasons.

Economic

The economic impact of the project itself was not terribly broad as income-generating activities were limited to members of CEBAB. The implications of the high level of demand created for cost recovery sanitation systems are however, quite significant. The project demonstrated that the population is willing to pay for sanitation services at a rate that can sustain the provision of those services. With a relatively small initial investment sanitation services can generate enough income to cover the costs of operating.

Cultural

IRC's strategy and techniques for delivering sanitation messages were designed to respect and account for the cultural norms and practices of the population. Therefore the use of theater, giant masks, parades, and soccer games to raise awareness of sanitation issues and support for hygiene intervention added to the culture of the intervention area. This is evidenced by the appreciation shown for these techniques by post intervention focus group participants.